

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. Claim 21 has been added and reads on the elected invention. After amending the claims as set forth above, claims 8-11 and 13-21 are now pending in this application.

Applicant wishes to thank the Examiner for the careful consideration given to the claims.

Rejection of claims 8-11 and 18-20 based on Koganezawa and Cornils

Claims 8-11 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,489,409 (“Koganezawa”) in view of U.S. Patent 5,108,526 (“Cornils”). For at least the following reasons, this rejection is traversed.

Claim 8 recites, among other things, a die having an opening including a first part with an unvariable shape and a second part with a variable shape, an extruder, a first gear pump, a branch part arranged upstream of the first and second parts which divides the die into a first passage connected with the first part of the opening for supplying the material and a second passage connected with the second part of the opening for supplying the material, and a valve mechanism. The valve mechanism is arranged in the second passage, adjusts a flow rate of the second passage, and is arranged to fully close the second passage when the second part is fully closed. Furthermore, claim 8 recites the steps of conducting a first sequence control to change the shape of the second part of the opening; conducting a second sequence control to change a rotation speed of the first gear pump in synchronism with the change in the shape of the second part of the opening; and opening and closing the valve mechanism within a width of the second passage to control an amount of the material to be supplied to the first and second passages.

In the method of claim 8, when the second opening is fully closed, the valve mechanism closes the second passage such that the material (such as a resin) does not flow through the second passage. But even if the second passage and second opening are fully closed, the material flows through the first passage, and the gear pump is not stopped. Accordingly, it is possible to prevent the degradation of material, unstable control, and the

galling of the gears. (See paragraphs 0024 and 0040 of the specification.) Koganezawa, Cornils, or any combination thereof fails to teach or suggest all the features of claim 8.

Koganezawa discloses a method and apparatus from making a window frame in which the shape of the opening portion of the molding die is varied and concurrently the flow rate is varied. Koganezawa does not teach or suggest first and second parts of an opening and first and second passages in which the second passage is connected to the second part of the opening with a variable shape and a valve mechanism that is arranged in the second passage, adjusts a flow rate of the second passage, and is arranged to fully close the second passage when the second part is fully closed. For instance, Koganezawa does not disclose that two independent first and second passages leading to a plurality of parts in the same opening. In other words, in Koganezawa, one passage is connected to both the variable portion and the unvariable portion. In addition, by virtue of the lack of teaching of first and second passages to the same opening, Koganezawa does not teach or suggest a valve mechanism arranged in the second passage, adjusts a flow rate of the second passage, and is arranged to fully close the second passage when the second part is fully closed.

Cornils does not cure the deficiencies of Koganezawa. For example, Cornils does not teach first and second passages in which the second passage is connected to the second part of the opening with a variable shape and a valve mechanism that is arranged to fully close the second passage when the second part is fully closed. Cornils discloses that the supply channels 16 and 17 are connected through the distributing chamber 15 to the orifice 14 (column 6, lines 12-32 and Fig. 1 of Cornils) but does not disclose that a part of the orifice 14 is closed (or even has a variable shape). It is an object of the method and system of Cornils to provide an extrusion die apparatus to produce an extruded profile with a uniform cross section. Cornils does not disclose that the shape of the cross section of any part of the orifice 14 is varied by closing a portion of the orifice 14. Thus, Cornils fails to disclose the variance of the shape of the cross section of a portion of an opening. Moreover, there is no suggestion or teaching about these features in Cornils.

Indeed, at curved areas and corners in Cornils, the supply channel 17 is varied so as to compensate the difference of the necessary quantities caused by the difference between the lengths of the inner and outer circumferences. Accordingly, in Cornils, the adjustment of the flow rate is only used for varying the flow velocity of the material extruded from the

extrusion die 5 (i.e., the extrusion speed). Thus, the supply channel 17 of Cornils is not fully closed in the straight section, and the supply channel 17 is regulated to be opened at the curved portion and corners, i.e., the supply channel 17 of Cornils continues the quantity supply, and increases the flow rate, if needed. Because Cornils does not teach a valve mechanism arranged to fully close the second passage or a part of the opening with a variable shape, Cornils does not teach or suggest a valve mechanism arranged to fully close the second passage when the second part of the opening is fully closed. As neither Koganezawa nor Cornils teaches or suggests first and second passages in which the second passage is connected to the second part of the opening with a variable shape and a valve mechanism that is arranged in the second passage, adjusts a flow rate of the second passage, and is arranged to fully close the second passage when the second part is fully closed, claim 8 is allowable over the prior art.

Furthermore, the extrusion molding method of claim 8 obtains a straight extrusion under constant extrusion speed in the opening's cross section. The adjustment of the flow rate is only used for the variation of the shape of the opening's cross section. An independent fluid passage is provided and arranged to supply the material to the variable portion of the opening's cross section in which the flow passage is varied from a maximum cross section when the fluid passage is fully opened to a minimum cross section when the fluid passage is fully closed to eliminate the variable portion so that the supply is continuously regulated. Koganezawa and Cornils fail to disclose that the flow rate is regulated from a maximum cross section to a zero cross section in accordance with the variation of the variable portion of the opening's cross section from a maximum cross section to a zero cross section. Moreover, there is no suggestion or teaching about these regulations in Koganezawa or Cornils. Indeed, the fluid rate balance of the material in Koganezawa, for example, is varied by the variation of the shape of the opening's cross section, i.e., the position at which the opening portion is closed. The invention of claim 8 is devised to address the problems associated with such a configuration in Koganezawa, and to attain the appropriate fluid balance in accordance with the shape of the variable portion of the opening's cross section.

Thus, there is no suggestion or teaching in Koganezawa and Cornils of the problems about the decrease in accuracy of the opening's cross section in accordance with the variation

of the flow rate balance. In contrast, in the invention of claim 8, the accuracy of the cross section is extensively improved.

For at least these reasons, claim 8 is allowable over the prior art.

Claims 9-11 and 18-20 depend from and contain all the features of claim 8, and are allowable for the same reasons as claim 8, without regard to the further patentable features contained therein.

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Allowability of claim 21

Claims 21 depends from and contain all the features of claim 8, and is allowable for the same reasons as claim 8, without regard to the further patentable features contained therein. For at least this reason, allowance of claim 21 is respectfully requested.

Conclusion

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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